Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Deconfined quantum criticality in bipartite SU(N) antiferromagnets in two dimensions[1] MATTHEW S. BLOCK, RIBHU K. KAUL, Department of Physics & Astronomy, University of Kentucky — The theory of deconfined quantum criticality shatters the celebrated paradigm of the Landau-Ginzburg-Wilson description of phase transitions by allowing for direct, continuous, quantum phase transitions between conventional, ordered phases that spontaneously break fundamentally different symmetries of the system. In this talk, I will present new results of a quantum Monte Carlo study of a local, SU(N) symmetric, antiferromagnetic spin model on the honeycomb and anisotropic rectangular lattices. In particular, I will show evidence for the existence of a continuous phase transition separating conventional Néel and valence bond solid ordered phases, as well as comparisons of the extracted critical exponents for sufficiently large values of N to those calculated analytically via a $1/N$ expansion solution of the CP^{N-1} gauge field theory that is believed to accurately describe the behavior at the critical point. In combination with previous results of a similar study on the square lattice, this allows for a robust understanding of how the existence of deconfined quantum criticality depends on the lattice symmetries as a function of N, and therefore gives a complete picture of the phenomenon in bipartite SU(N) systems in two dimensions.

[1]Partial financial support was received from NSF DMR-1056536.

Matthew S. Block
Department of Physics & Astronomy, University of Kentucky

Date submitted: 08 Nov 2012 Electronic form version 1.4